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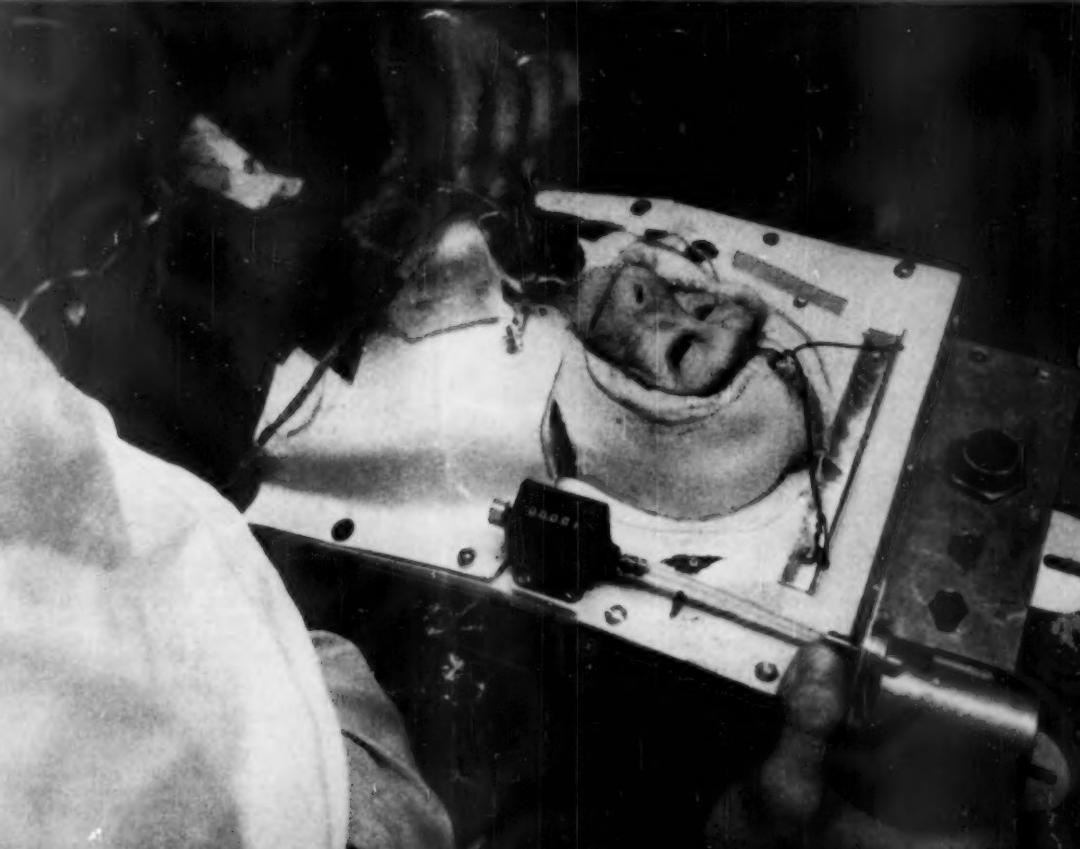
June 6, 1959

VOL. 75 NO. 23

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# SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Space Traveler

See Page 355

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## ASTRONAUTICS

# Space Flight Succeeds

**Two monkeys have successfully completed a round-trip into space, the nose cone in which they made the journey being recovered in less than two hours after launching.**

## See Front Cover

TWO LITTLE monkeys, one clad in a space suit and the other lying in a special capsule with her knees drawn up under her, were blasted 300 miles into space on Thursday, May 28, from Cape Canaveral, Fla., the National Aeronautics and Space Administration has revealed.

Drama of the experiment was heightened as U. S. Navy frogmen successfully snatched the missile nose cone from shark-infested waters in the Atlantic Ocean. This makes the animals the first monkeys known to have been shot into space and successfully retrieved.

The pre-dawn experiment, using a Jupiter intermediate-range ballistic missile, had five objectives:

1. To recover the Jupiter nose cone with its two passengers.
2. To test the behavior of "Monkey Able," a seven-pound American-born rhesus monkey who had been trained to work a telegraph key.
3. To measure physiological reactions of "Monkey Baker," a one-pound squirrel monkey.
4. To carry out biological experiments for radiation studies on cellular systems such as those of human blood, fruit fly larvae, mustard seeds, corn, yeast and fish eggs.
5. To see what effects radiation and weightlessness might have on cell division and egg fertilization.

The photograph on the cover of this week's SCIENCE NEWS LETTER shows a rhesus monkey in the special space suit, lying on a glass fiber contour couch such as the one used by test monkey Able.

The monkey experiment helps pave the way for "Mr. Mercury," one of the seven men to be chosen by NASA to ride the first manned space capsule in orbit. Using telemetering equipment, earth-bound scientists were able to study the effects of noise, acceleration, deceleration, vibration, rotation and weightlessness upon the two little monkey pioneers as they zoomed into space, then whistled back at 10,000 miles an hour to their Atlantic landing point.

Monkey Able's "co-pilot," as NASA called her, rode in a 28-pound capsule measuring 9.75 by 12.5 by 6.75 inches. Dressed in a helmet of molded plastic compound over chamois, and lying on a bed of silicone rubber overlaid with foam rubber, Monkey Baker was a "living laboratory."

Her contribution to the experiment was in terms of such things as an electrocardiogram (to show how her heart was working under the space stresses), an electromyogram (to show how her muscle reaction was bearing up), heart sounds, pulse velocity from large blood vessels, body temperature and respiratory rate.

During their ride 1,500 miles over the Atlantic Missile Range the monkeys were kept in a weightless state for about nine minutes.

The project was a joint effort of the U. S. Army, Navy, Air Force and National Aeronautics and Space Administration.

Recovery was made by the U. S. Navy and Air Force. Recovery gear included two destroyer escorts, a fleet tug, the U.S.S. ATF Kiowa which effected the actual recovery, and two P2V aircraft.

The ships sailed in advance to the area where the spent nose cone was expected to plunge to its watery end. Airplanes helped guide the Kiowa to the nose cone. It was spotted via a dye marker, a five-foot orange-and-blue balloon sporting a flashing light on the top, and a radio transmitter used as a beacon.

A capsule of shark repellent was released to protect Navy frogmen who secured hoisting lines to the cone suspended in the water beneath the balloon.

The recovered nose cone and its contents were shipped to San Juan, Puerto Rico, and then to the U. S. mainland for further study.

Two of four tiny capsules included in the nose cone experiments of a Jupiter IRBM contained mold spores sensitive to radia-

tion. Study of the spores should provide important information on the spores' ability to live in outer space. Some scientists believe that spores may have been the original "space travelers." They may be the only life capable of survival in the temperature and atmosphere encountered in space.

Results of the experiments, involving vials, cylinders and capsules containing whole blood, yeast cells, sea urchin eggs and sperm, young fruit flies, corn kernels and tissue from onions (both white and purple), will be reported later, the National Aeronautics and Space Administration said. Agencies of the Government as well as educational institutions carrying out biomedical research will receive the experimental data on request.

Researchers are particularly interested in learning the effects of weightlessness, cosmic rays, radiation, temperature and gravity forces on various tissues and organisms. Some of the results, such as the experiments with whole human blood, will have direct bearing on man's flight into space. Others, such as examination of fruit fly pupae for radiation damage, will help answer basic problems in biology.

SCIENCE NEWS LETTER, June 6, 1959

## GENERAL SCIENCE

### New Science Adviser Is Explosion Expert

PRESIDENT Eisenhower's new science adviser, Dr. George B. Kistiakowsky of Harvard University, is an expert on explosives and explosions, among other subjects.

During World War II he was first chief of the explosives division of the Office of Scientific Research and Development, then in 1944 became chief of the explosives division of the Los Alamos Laboratory, where the atomic bomb was developed.

Dr. Kistiakowsky was a member of the National Academy of Sciences' committee on atomic energy as early as 1941.

As official historians, Dr. Kistiakowsky and Dr. Ralph A. Connor have reported on United States work on military explosives during World War II. Their work covered the synthesis, testing and production of explosives, including underwater explosives, gun propellants, propellants for rockets and high explosives for use in shells and bombs.

One of the new explosives developed, RDX, is described by the scientists as an "example of perfect international cooperation in research."

Dr. Kistiakowsky is a 58-year-old Russian-born chemist who became a U. S. citizen in 1933. He is a member of the National Academy of Sciences and the President's Science Advisory Committee.

He is replacing Dr. James R. Killian Jr. who will resign in mid-July to return to Massachusetts Institute of Technology in his new post as chairman of the MIT Corporation.

Dr. Kistiakowsky's other specialties include chemical kinetics, the thermodynamics of organic molecules and molecular spectroscopy. He is the author of the book, "Photochemical Processes."

SCIENCE NEWS LETTER, June 6, 1959



**MONKEY BAKER**—A squirrel monkey is shown wearing the special molded plastic helmet over chamois like the one that protected Monkey Baker in her space flight and recovery.

## SOCIOLOGY

# Problems of Caribbean

**Scientists are contributing to our knowledge of the political, social and economic problems of the Caribbean peoples at a time when this information is extremely important.**

THE EXTREMELY complex and diverse social and political problems of peoples in the Caribbean were discussed by a group of social scientists in a two-day conference in New York.

Recent political changes in the Caribbean because of their importance to U.S. economy and national defense intensified interest in the conference, called "Social and Cultural Pluralism in the Caribbean." Dr. Morton Klass of Columbia University told the Conference that the term "plural society" is inadequate to describe the differing value systems, religions and cultural organization present on even the single island of Trinidad.

Two large ethnic groups of almost equal size, "West Indians" and "East Indians," make up the bulk of the population, Dr. Klass reported.

In the West Indian "Creole" culture, greater prestige is accorded to European rather than African-derived cultural and physical traits so that color, even in such an overwhelmingly black society, is a factor in determining status.

The majority of Trinidad East Indians, rural Hindu cane laborers, derive their values from India. Color, or absence of it, is relatively unimportant to them, but caste membership is significant.

The West Indian group want assimilation and a single socio-cultural system. The East Indians want a separate and equal status. This desire seems to be intensifying and the East Indian population in Trinidad is growing rapidly.

One attempt to reach a solution of problems in the Caribbean was the establishment on April 22, 1958, of the West Indies Federation, which brought together in a single organization ten British island colonies, including Jamaica and Trinidad.

A survey of the opinions of 238 Jamaican leaders concerning the Federation was reported by Dr. Wendell Bell of the Center for Latin American Studies, University of California, Los Angeles.

More than half of the Jamaican leaders believe that Jamaica has more to lose than gain by being part of the West Indies Federation.

Their attitude toward independence is very different. Only a fourth believe that Jamaica would lose rather than gain by political independence from the United Kingdom. There is strong sentiment, Dr. Bell found, in favor of Jamaica's striking out for herself and becoming an independent nation in her own right, but this sentiment is not shared evenly by all segments of the "elite" group.

Dr. Bell's survey was conducted during the summer of 1958.

The political relationships between the

French West Indies and France—integrated as departments of the mother country—are unique in the Caribbean and rare throughout the colonial world, Dr. Michael M. Horowitz of Columbia University said.

Not all socio-economic groups are in sympathy with the new status. The white plantocracy, fearing loss of political control, would like a return to colonial status and maintains an estate-like relationship toward others that has been rare in France since the 18th century. The intellectual and professional group, composed largely of Martiniquans of color, has been more in sympathy with the values of contemporary France.

Science News Letter, June 6, 1959

## CONSERVATION

## Federal, Local Workers Aid Watershed Programs

"LOCAL PEOPLE" in charge"—this is the strongly appealing feature that sets the watershed program apart from many others involving governments from local on up to Federal level.

The Watershed Protection and Flood Prevention Act of 1954 closed a gap in the nation's water conservation program, Secretary of Agriculture Ezra Taft Benson told the Sixth National Watershed Congress in Washington. Since this legislation became law, there has been a way to manage water as it flows through thousands of small watersheds.

As a result, Secretary Benson said, for the first time in American history we now have sound programs "under which Federal, state and local people are attacking the conservation problem on every front," conserving soil, water, timber and human resources.

So far some 436 applications have been approved for help in planning watersheds—land areas that drain into particular bodies of water. Of these, 164 work plans have been developed and approved by the USDA. This means that effective flood controls and water conservation methods will be in operation in many areas. Each community depends on the water intake and output of its own watershed. The experts agree that problems of water shortage, floods, pollution or sedimentation must be met within the confines of each watershed.

Secretary Benson pointed out four steps the Federal Government can take to increase the effectiveness of the watershed program: 1. promote "more harmonious action" among the Federal agencies concerned with the program; 2. complete needed land treatment and structural work

in the 11 authorized major watersheds; 3. strive for better Federal-state working relationships; and 4. show citizens how they can take action.

Persons attending the watershed congress toured through the Rock Creek Watershed in the District of Columbia and nearby Maryland. This watershed, its problems and development are typical of many urban-rural areas throughout the nation. Plans for its development are, however, largely in the early stage.

Some 25 organizations representing farmers, conservationists, industry and Government participated in the congress which celebrated five years of progress in water and soil resources programs.

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## EDUCATION

# Strengthen Education

**The President's Science Advisory Committee has published a report in which several recommendations are proposed for improving education in all fields in the United States.**

PRESIDENT EISENHOWER has called for the strengthening of all education in the United States, particularly in science and engineering.

Releasing an "excellent statement" of U. S. educational goals and needs, the President stressed the importance of raising the standing of teachers in their communities.

Higher salaries are a first requirement, Mr. Eisenhower said, but the great importance of what teachers do should be recognized. They should be given the "encouragement, understanding and recognition" that will help to make the teaching profession attractive to increasing numbers of first-rate persons.

The 33-page report was issued by the 17-man President's Science Advisory Committee, headed by Special Assistant, Dr. James R. Killian Jr. It was prepared by a nine-man panel on science and engineering education, with Dr. Lee A. DuBridge, president of California Institute of Technology, as chairman.

Doubling the current annual investment in education is probably a "minimal rather

than an extravagant" goal, the scientists concluded. To reach this goal, the report made 22 recommendations.

Of all the concrete actions called for, the most urgent is revision of course content and provision of teaching aids for each year of school.

To reach these goals, the report noted four major areas needing specific and urgent attention throughout the educational system. These are the curriculum and content of courses, the quality and effectiveness of teachers, the recognition and encouragement of students, and the development of intellectual leadership. The 22 recommendations for action fell into one of these four categories.

Included under the goal of lifting student performance to higher levels of excellence by offering greater motivation were specific recommendations for:

1. A nation-wide effort to pay more attention to the academically talented students, those in the upper 20% of their group, and to the unusually gifted students, in the upper three percent.

2. Necessary help in financing the high school education of such gifted students, as well as in college and graduate school.

3. Programs of prizes and scholarships being extended into the high school level so that students even in remote and rural communities are enabled to attend high schools providing opportunities commensurate with their abilities.

4. The combining of public and private agencies to offer on a national basis a much larger number of prizes than now exist to high school students for unusual intellectual achievement in important fields.

The U. S. at present spends approximately \$15 billion a year on formal education. Increasing this by a fraction of one percent, during a period of only a few years, would mean an increase in the efficiency of the teaching process that would yield benefits out of all proportion to the cost.

The report concluded that:

1. "Americans should attach greater value to intellectual excellence.

2. "Every school and college should re-examine its curriculum to make sure that in every aspect it is giving adequate challenge to the intellectual capacities of its students.

3. "We should do far more than we are now doing to enhance the prestige of the teacher and to provide him with more effective support in his efforts to improve the effectiveness of his teaching.

4. "We should move much further in the direction of adapting our educational programs to the widely varying competence of students, and seek especially to meet the needs of the most gifted students.

"We should improve our scientific education at all levels, attempting to give better understanding of science to the non-scientist as well as to discover and stimulate more individuals who have the talents to become scientists and engineers."

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## METEOROLOGY

## Propose Finding Density At 300 Miles by Balloon

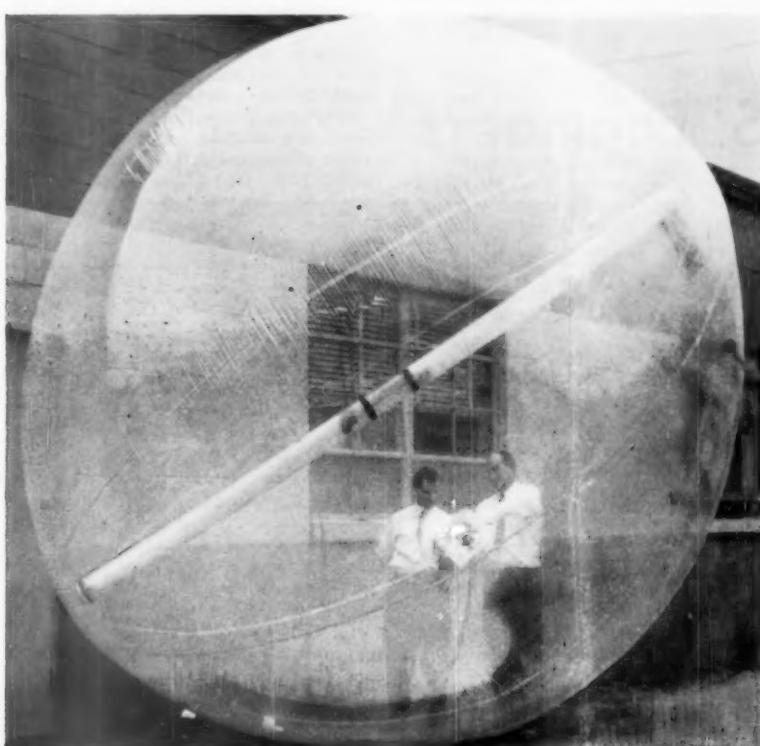
A SCHEME for finding the density of the atmosphere 300 miles above the earth from information relayed back using a balloon ejected from a two-stage rocket has been devised.

As a research project for the Air Force Cambridge Research Center, Bedford, Mass., scientists at Arthur D. Little, Inc., have developed an inflated sphere with instruments and radio system to measure density drag up to the 300-mile height.

The rocket's first stage will be an Aerobee research rocket, the second a solid propellant Sparrow rocket. The 18-pound payload is a mylar plastic sphere that balloons to nine feet in diameter when ejected and inflated.

Instruments and telemetry equipment are contained in hollow plastic strut inside the balloon. The balloon will be released at about 60 miles, then follow the trajectory of the rocket up to the zenith of 300 miles. This free flight is expected to take between seven and eight minutes.

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**BIG BALLOON**—David A. Knapton and David B. Lull, who heads the density project, are shown inflating the plastic balloon.

## PHYSICS

# Study H-Bomb Effects

NEW EFFECTS of high-altitude hydrogen bomb tests such as the U. S. conducted in the South Pacific last August have been reported.

Three scientists present evidence strongly suggesting that the D-layer of the ionosphere, the lower part of earth's radio reflecting "roof," becomes electrically conductive to a higher degree than normal at distances from the explosion far greater than expected. Such effects mean a disruption of radio communications at certain frequencies.

The scientists say the effects had been noticed at places remote from the explosion. They had also been noted far from the area on the earth's surface at the opposite end from the explosion point for lines of force in the earth's magnetic field.

The increased ionization of the ionosphere was noted on three wavelengths at the Hiraiso Radio Wave Observatory in Japan, at 15 megacycles and 10 megacycles from Honolulu, and 13.75 megacycles from San Francisco. The disruption of communications at these frequencies was much more pronounced from the Aug. 1 blast than from the Aug. 12 explosion. The scientists offer no explanation for this difference.

Besides the increased ionization, the scientists also found an increase in the radio noise level at 28 kilocycles.

Both effects, they report, are "entirely similar to those accompanying sudden iono-

spheric disturbance due to a solar flare." The sun-caused disturbances are known to be due to increased ionization of the D-layer. High-altitude hydrogen bomb explosions cause the same effects.

Another scientist has said the ionosphere behaves as if the sun suddenly shown in the middle of the night.

Since the man-made effects are not confined to regions influenced by particles guided by the earth's magnetic field, they report that some other mechanism must also be involved.

Two possible mechanisms are suggested by Dr. T. Obayashi of Japan's Radio Research Laboratory, Nakimato-shi, Ibaraki-ken, and Drs. S. C. Coroniti and E. T. Pierce of AVCO Research and Advanced Development Division, Wilmington, Mass.

One possibility is that the hydrogen bomb blast acts like a thunderstorm, including the direct production of ionization by the electromagnetic radiation of long wavelength generated by the explosion.

Another possibility, reported in *Nature* (May 23), is the production of shock waves by the blast. These shock waves would then interact with the earth's magnetic field to produce hydrodynamic effects. The Aug. 12 record at 13.75 megacycles shows "intriguing" violent oscillations hinting at such effects, they note.

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The drilling experiment has captured world-wide interest, and the American Miscellaneous Society has revealed itself as a colorful group. Although deadly serious over Project Moho, AMSOC perhaps has earned this reputation through such mottoes, quoted in *Science*, as: "The ocean's bottom is at least as important to us as the moon's behind!"

Mr. Lill, head of the geophysics branch of the Office of Naval Research, and Dr. Maxwell, an ONR oceanographer, say this motto merely is a reminder that much remains to be learned about the earth, as well as the new areas being opened by man's conquest of space.

Science News Letter, June 6, 1959

## ENGINEERING

## Transatlantic TV Within Five Years

A FIRST-CLASS radio link between the United States and Europe, via the moon, will be operated within three years. And the first television pictures may be beamed well within five years.

That is the belief of John Brinkley, managing director of Pye Telecommunications Ltd., Cambridge, England, who actively cooperated with scientists at Manchester University's Jodrell Bank radio telescope in sending the first signals 480,000 miles through space to the U. S. on May 15.

British telecommunication experts will now push on at top speed to design suitable equipment for an interference-free commercial link. Mr. Brinkley was delighted with the success of the Jodrell Bank experiment, in which conventional equipment of comparatively low power was used.

"The biggest attraction is the establishment of a first-class radio link with the whole of the British Commonwealth," he said. "It is easy to lay a submarine cable across the Atlantic, but not to Australia, New Zealand, Singapore and Hong Kong. Moon traffic means that the need for submarine cables will be removed."

Mr. Brinkley said that the first TV pictures across the Atlantic would probably be sent via metal-plastic balloons, 100 feet in diameter, suspended in space. Such balloons could already reflect the "wide band" frequencies used in today's TV transmissions.

Before the moon could be used as a TV reflector new "narrow band" transmitters have to be designed.

British scientists will now experiment by sending signals of ultra-high frequency via the moon to other parts of the world. For the higher the frequency the more "channels" of communications are opened up. At present, "channels" used by commercial cable companies are heavily overcrowded.

Communications with other parts of the world will depend on the moon's position in relation to the earth at certain times of the day. But there will be a period each day when Russia will be powerless to interrupt or jam communications between the U. S. and Britain.

Science News Letter, June 6, 1959

## GEOPHYSICS

# Challenge U. S. Engineers

IT MAY take real Yankee ingenuity to carry off the glamorous, much-publicized \$5,000,000 project of pricking the earth's skin to sample its heart—known in scientific circles as "Project Moho."

The idea is to drill to the Mohorovicic Discontinuity, a layer in the earth which separates the crust from the mantle. The Project is expected to yield information on "the most important unsolved problems of geophysics."

But drilling down 16,000 feet, especially from an ocean site, means many problems must be solved first.

Added urgency for the United States' success is being felt as Russia pressures its scientists to beat America at this project. This would give Russia a double-edged propaganda weapon as the first nation to launch a satellite, and the first to drill into an earth layer never before tapped by man.

It is known that the Soviet Academy of Sciences has set up a new branch in Novosibirsk and charged it specifically with solving the problems of deep drilling. Even as early as 1957, the Russians said they had the equipment and capability to do the job.

But does the U. S.? Two experts say a "Drilling Methods" panel has been organ-

ized by the American Miscellaneous Society (AMSOC) to devise new techniques or determine the best old ones that AMSOC can use on Project Moho.

Gordon G. Lill and Dr. Arthur E. Maxwell, writing in *Science* (May 22), say the earth's mantle is a depth of five kilometers (about 3.1 miles) below the Central Pacific earth floor—well within reach of present drilling equipment.

But it will take a "great deal of study," they say, to determine if drilling can be undertaken from a barge to depths of 16,000 feet below the sea floor, under water 15,000 to 18,000 feet deep.

A new, special drilling barge may have to be designed, they suggest. Heavy strings of drill pipe, maybe 30,000 feet long, will be required. No present drill barge can handle the lengths of pipe that will be needed, the two scientists report.

Furthermore, power supplies must be studied. Smooth delivery of power will be essential. They report a proposal has been made for supplying power right at the bottom of the ocean rather than from a barge at the surface. This would eliminate the 15,000 to 18,000 extra feet of drill stem needed to get through the water,

## PLANT PHYSIOLOGY

# Study Effects of Fallout

WHEN THE strontium-90 level in milk gives "cause for concern," farmers may have to restrict their dairy cows to an all-grass diet.

Studies of some 16 different grasses and legumes (clover, and bird's-foot trefoil), grown in soils with varying amounts of calcium and strontium indicate there are significant differences in strontium uptake.

Neither radioactive nor stable strontium was added to the soil "because the very small amounts of native strontium should give a better picture of the uptake of minute amounts of strontium by plants," two scientists report in *Nature* (May 23). They found that every legume took up more strontium than any grass—three to six times as much in many cases.

Among the legumes, Tallarook clover, or *Trifolium subterraneum*, took up the most strontium, while bird's-foot trefoil took up the least, Drs. P. B. Vose and H. V. Koontz say.

As long as the present level of atomic weapon testing is maintained, the scientists said, it is unlikely that dairy cows will have to be kept on a grass-only diet. However, "in the future it might prove desirable to take this measure to reduce the strontium-90 level in milk, particularly that consumed by children," they conclude.

Where there is high rainfall or other factors that may cause more than average radioactive-strontium content in milk, such special feeding may be necessary.

Grass would also be the preferred plant for reclaiming land heavily contaminated with strontium-90, the scientists point out.

Dr. Vose of the University College of

Wales, Aberystwyth, carried out the study at the University of California's department of agronomy in Davis with which Dr. Koontz is affiliated.

Dr. F. R. Fosberg, of the National Research Council's Pacific Vegetation Project, reports in the same *Nature* that a re-survey in 1956 of the plant life in the Marshall Islands indicate certain abnormal or pathological conditions. These, he says, increase from "islet to islet in the same order as the increase in fallout intensity."

Earlier surveys, in 1954 and 1955, of the effects of fallout from the 1954 Bikini hydrogen bomb had indicated no visible effects on plants.

Pointing to the fact that these latest observations are still of a preliminary and inconclusive nature, Dr. Fosberg says that symptoms ranged from dead plants to chlorosis (whitening of green parts), dead end twigs and "mistletoe-like" abnormal growths." One islet was so altered, he says, that it was a gray color instead of green.

The extreme range of plant reactions to fallout suggest that a wide variety of plants be studied in any experiments investigating the effects of fallout, Dr. Fosberg suggests.

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## MEDICINE

## American Indians Have Low Cholesterol Level

AMERICAN INDIANS have lower serum cholesterol levels, the suspected culprit in hardening of the arteries and other heart diseases, than the general population.

In fact, the Navajo has both a low

cholesterol level and a low rate of heart disease. Other Indian tribes that were studied include the Crows, Sioux, Pueblo, Apache and Lac Courte Oreilles. These too have low cholesterol levels, but there is no information pertaining to these tribes' rates of heart disease in the *Public Health Reports* (May), issued by the U. S. Public Health Service.

Indian women had the lowest levels, while the levels of Indian men, although higher than the women, were lower than the levels of a sample group from the general United States population.

The cholesterol level of Indians, as in other low cholesterol level populations, does not continue to rise after the Indians reach the age of 39, Sidney Abraham of the heart disease control program of the PHS and Dr. David C. Miller of the Public Health Service Indian Hospital, Tuba City, Ariz., report in the journal.

A study of the Navajos revealed the fat intake of their diet did not differ greatly from the normal fat intake of the general population. Since this group of Indians has a low incidence of heart disease, researchers suspected there might be some hereditary factor that determines the development of heart disease.

The other tribes studied were grouped according to ancestry. Results indicate serum levels of cholesterol do not differ greatly between those who are part Indian and those who are full blooded, the investigating team says.

However, one group within the Navajo tribe exhibited a higher serum cholesterol level than the other groups, suggesting that some environmental factors govern the serum level.

Cholesterol is a fat-like deposit that accumulates and sometimes blocks the arteries. Whether or not a high level of cholesterol in the blood causes heart disease is a controversial subject among scientists.

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## ASTRONOMY

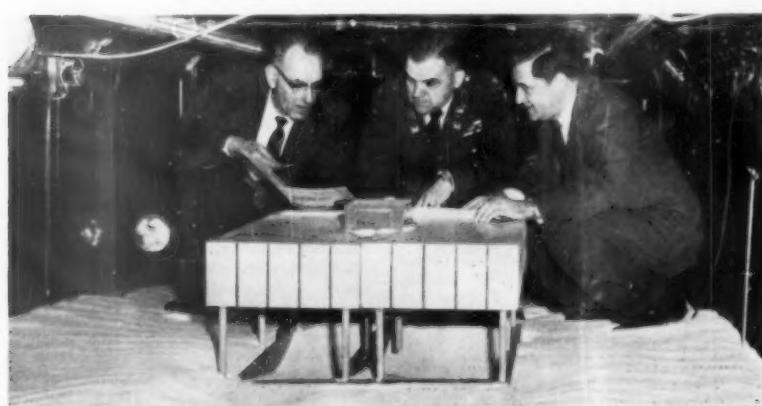
## 5,940 Sunspots Analyzed For 16-Year Period

THE 5,940 SUNSPOT groups seen by astronomers at Mt. Wilson Observatory in California from 1937 to 1953 have been analyzed and the statistics reported to the Smithsonian Institution Astrophysical Observatory.

The study covered frequency of spot groups occurring in the various magnetic classes, and the dependence of this frequency on the size and age of the spot groups. It also covered some aspects of the apparent differences in spot distribution between the east and west sides of the solar disc, and the distribution of 8,403 observed solar flares among spot groups of various magnetic classes, sizes and ages.

The analysis was made by Drs. Harold Glazer, now at the Raytheon Maynard Laboratories, Maynard, Mass., and Barbara Bell of Harvard College Observatory.

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**SNOWDRIFT**—A raging snowstorm, complete with drifts, was simulated inside the wind tunnel of New York University's Engineering Research Division. Shown, left to right, are Dr. R. W. Gerdel and Col. Walter H. Parsons Jr. of the U. S. Army Corps of Engineers' snow, ice and permafrost research establishment, and Prof. Gordon H. Strom of NYU. The model building in the foreground is built on pilings.

## TECHNOLOGY

**First Ocean Delivery  
Of Liquid Methane**

THE METHANE Pioneer, a converted 5,000-ton dry cargo ship, has made its first delivery of liquid methane to gas-deficient England, successfully completing the first trans-oceanic delivery of liquid methane in history.

The ship carried the methane at atmospheric pressure and minus 258 degrees Fahrenheit in special aluminum tanks installed in the hold of the ship. The maiden voyage climaxed five years of research and development by Constock International Methane Ltd., which is owned by Union Stock Yard and Transit Company, Chicago, Ill., and the Continental Oil Co. of Houston, Texas.

Methane is the principal component of natural gas and liquefies at minus 258 degrees Fahrenheit. When it liquefies, it reduces to 1/600th its gaseous volume. It is impractical to hold large amounts of methane as a liquid under pressure, and scientists for years have been studying methods of transporting liquid methane at extremely cold temperatures to avoid the pressure problem.

The voyage is said to mark the beginning of a new era in which natural gas, previously wasted or shut in for want of accessible markets, can be liquefied and transported by tanker to countries where gas is not naturally available and energy must be supplied by gas manufactured from coal or oil at high costs.

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## AERONAUTICS

**Jet Planes Seen No Threat  
To Real Estate Values**

JET PLANES will not adversely affect the value of real estate in the vicinity of airports.

Studies of properties surrounding airports in Chicago, Los Angeles, Denver, Newark, Dallas, and New York City show that, "generally speaking," municipal airports do not unfavorably influence the market value of real estate in adjacent areas, H. O. Walther, past president of the American Institute of Real Estate Appraisers, said.

Speaking in Chicago at a panel discussion on the effect of the jet on real estate, sponsored by the American Society of Real Estate Counselors, he offered the following six findings in support of his conclusion:

1. More than 800 double transactions revealed that market behavior is about the same in airport areas as in non-airport areas.
2. More than 30,000 buildings, mostly homes, had been built within a mile of the six airports in a 12-year period from 1940.
3. The number of properties for sale in the airport areas was in most cases less than in comparable areas.
4. No appreciable difference in market

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behavior was apparent between areas in the path of flight and other areas.

5. Airport areas which included homes were in good condition with better-than-average maintenance.

6. Trade opinion of real estate brokers active in the areas showed that airports had not influenced the value of homes adversely.

Although noise, interference and anxiety do exist in areas adjacent to airports, Mr. Walther said, the studies suggest that either their effect is small or there are other compensating factors.

Among the compensating amenities, he listed better transportation facilities developed because of the airport, strengthened demand for housing by airport employees, and new, airport-oriented industries that offer more job opportunities.

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## NUTRITION

**Insufficient Diet Causes  
Little Alarm**

PEOPLE SUFFER from poor diets because they also suffer from another condition—apathy.

Apathy, or indifference, is one of the major causes of inadequate diets, Dr. L. A. Maynard of Cornell University says.

Although sufficient food supplies are available, surveys continue to show that a considerable number of persons fail to follow diets that meet the recommended dietary allowances.

There is a widespread lack of appreciation of the importance of a good diet and a lack of knowledge of how to select such a diet, he asserts.

An adequate diet can be obtained by selecting foods from each of the following basic food groups. Milk is the first group. This includes cheese and ice cream. Dr. Maynard recommends that children have three to four cups of milk daily; teenagers, four or more cups; adults, two or more, and expectant mothers, four or more cups. Meat is the second group. Two or more daily servings of beef, veal, pork, lamb, poultry, fish or eggs are recommended. Dried beans, peas, and nuts may substitute for meats.

The third group includes fruits and vegetables. Four or more selections should be included each day. These servings should consist of at least one dark green or deep yellow vegetable at least every other day, citrus fruit or other fruits containing vitamin C, and vegetables including potatoes.

The last group includes bread and cereals. Dr. Maynard recommends four or more daily servings from this group.

The food supply of this country is so large and provides such rich and varied sources of the nutrients needed that it is readily possible for everyone to have an adequate diet from those foods available, he concludes.

Dr. Maynard's remarks appear in the *Journal of the American Medical Association* (May 23).

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**IN SCIENCE**

## VOLCANOLOGY

**Volcanic Eruption  
In Belgian Congo**

ONE OF THE MOST important eruptions of a volcano in the area during the last 50 years occurred last year in the Belgian Congo.

Dr. E. Berg of the Institute for Scientific Research in Central Africa, Belgian Congo, said the lava outflow, when it stopped on Nov. 21, 1958, measured about 12 miles. The highest outflows from the very spectacular cinder cone were about 50 cubic yards in a second.

A preliminary eruption occurred on Aug. 7, on the northern side of Nyamuragira in the active area of the eastern Belgian Congo. A swarm of very small earthquakes preceded the eruption by about three hours, and continued to the beginning of the main eruption on Aug. 10 at a place called Kitsimbanyi. Dr. Berg's report appears in the *Journal of Geophysical Research* (May), published by the American Geophysical Union with support of the Carnegie Institution of Washington and the National Science Foundation.

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## FORESTRY

**New Virus Threatens  
American Elms in East**

A SLOW moving "fire" is leaving a trail of scorched elms.

The fire is a virus disease that poses a new threat to the elm tree and the American elm in particular, Dr. Horace V. Wester, plant pathologist, U. S. Department of the Interior, told SCIENCE SERVICE. So far some ten percent of the elm population is affected in the Washington, D. C., area, with every indication it is widespread in the Southeast.

Elm scorch, as the disease is called, moves slower than the Dutch elm disease, but it definitely ruins a tree. Leaves turn brown as though scorched by fire and then die off. Preliminary studies indicate cork elm is resistant to the disease.

There is no cure for the disease. How the virus is spread is currently under study, with tiny leafhoppers or tree hoppers the most suspicious of the insect vectors or carriers. Dr. Wester is hopeful that researchers will be able to "run down" the vector in the next couple of years. It takes approximately four to six years for the virus to kill a tree.

A report on the successful transmission of elm scorch from diseased to healthy trees, prepared by Dr. Wester and Dr. Edward W. Jylkka, also with the Interior Department, appears in the *Plant Disease Reporter* (May 15).

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# SCIE FIELDS

## MEDICINE

## Juggling Drug Therapy Protects TB Patient

JUGGLING THE SEQUENCE of drug combinations in tuberculosis cases delays the development of eventual bacterial resistance to the drugs.

Alternating the combinations dodges temporarily the big problem in antimicrobial therapy, Dr. E. T. Peer of the Niagara Peninsular Sanatorium Association, St. Catharines, Ont., Canada, reported. Dr. Peer spoke at the National Tuberculosis Association meeting in Chicago.

Two drugs are ordinarily given over long periods of time in treating tuberculosis. The most effective combinations are isoniazid and PAS, para-aminosalicylic acid, or isoniazid and streptomycin.

The tubercle bacilli have never been known to develop resistance to a drug in less than three weeks when the drug was used alone, Dr. Peer pointed out. Furthermore, resistance is delayed when two drugs are used together.

Thus, the Canadian physician has employed a regimen of streptomycin and PAS for the first month, then isoniazid and pyrazinamide for the second, then back to the first regimen, and so on, alternating the drug regimen every month.

Two hundred patients who had never before received any tuberculosis drugs were tested by Dr. Peer.

He found that by using this alternating method, every case became bacteria-free within six months. Most cases became bacteria-free in two or three months. However, the bacteria have not regained a foothold and none of Dr. Peer's patients have suffered from a bacteriological relapse, he said.

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## MEDICINE

## Monkey "Executives" Get Ulcers Also

MONKEYS develop stomach ulcers when subjected to stress-producing conditions, Dr. Robert W. Porter of the University of California Medical School, Los Angeles, has found.

He said the ulcer-producing experiments are designed so that monkeys are constantly meeting new situations involving electrical shocks and making decisions as to how to avoid the shocks.

Thus, he reported, the animals are under considerable stress, "roughly equivalent" to the pressures of a modern business executive.

In a few weeks under these stressful conditions, the monkeys developed stomach ulcers similar to those of human beings. In addition, significant changes in the choles-

terol level were recorded and there was some indication after autopsy that atherosclerosis had developed.

In another part of the study monkeys electrically stimulated a certain part of their brain by pressing a lever. Apparently this elicited a pleasurable sensation, for the monkeys sat for hours pressing the lever rapidly. This self-stimulation resulted in many of the psychosomatic disorders seen in the other experiments.

Analysis of blood constituents and waste products of the stressed monkeys is giving a picture of the hormonal or chemical changes produced by stress.

It is through such detailed studies of the neurophysiological and biochemical processes produced by stress that there is hope of finding preventive measures for resultant psychosomatic disorders, Dr. Porter said.

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## METEOROLOGY

## High Winds Charted By Copper Chaff

JET AGE airplane passengers will have smoother rides and persons plotting the paths of missiles will have fast and accurate information on winds aloft, thanks to a new method of charting motions of air up to some 100,000 feet above the earth's surface.

The new method involves tracking "chaff" made of copper instead of aluminum foil, after it has been automatically tossed out of a high-flying rocket. Chaff reflects radar waves and was first used during World War II to clutter enemy radar scopes. Now weathermen are using its reflecting properties to learn about the winds at high altitudes.

The copper chaff payload for HASP, the High Altitude Sounding Projectile, was designed by scientists at the Naval Ordnance Laboratory, White Oak, Md. Its successful use means that weather information at high altitudes obtained by HASP will be gathered much more swiftly and accurately than was previously possible.

In tests at the Naval Aviation Ordnance Test Station, Chincoteague, Va., the new payload was tracked by radar from 100,000-foot altitude down to 50,000 feet in 15 minutes. At these altitudes, the copper chaff falls at an average speed of about 3,100 feet per minute, compared to only 450 feet per minute for the standard aluminum foil chaff.

This performance now enables weathermen to determine with one HASP payload the wind direction and velocity over an altitude spread ten times greater than that previously measured by the slower-falling and faster-dispersing aluminum chaff.

From the tests Navy scientists learned that wind speed averaged about 20 miles an hour at 100,000 feet. At 50,000 down to 40,000 feet, the much faster wind velocities of the westerly jet stream were from 100 to 160 miles per hour, respectively, for each altitude. The wind speed decreased to 110 miles per hour at 20,000 feet, and to 80 miles per hour at 15,000 feet.

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## TECHNOLOGY

## Fission Wastes Stored Underground in Glass

A WAY safely to store dangerous strontium-90 and other radioactive fission products underground in glass has been developed.

At Chalk River, Ontario, Canada, the Atomic Energy of Canada Limited has been seeking a cheap and long-lasting treatment for dangerous waste products, Dr. A. R. Bancroft told the Chemical Institute of Canada meeting in Halifax, Nova Scotia. The investigators found a reasonably simple operation will entomb fission products in glass.

Glass is only slightly attacked by water, thus it could be safely buried without endangering future generations through eventual release of fission products from it.

When nuclear reactors are used for the generation of electricity, each reactor generating 200,000 kilowatts will produce about 1.5 pounds of fission products per day. The processing of these fission products into glass would be a small but important operation in the nuclear power system. Preliminary estimates of the cost of disposing of fission products this way have proved favorable, said Dr. Bancroft. This factor will be studied closely in the next year.

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## PUBLIC HEALTH

## 15-Minute Rabies Test Proves Successful

RABIES can now be successfully detected in animals within 15 minutes, compared to the old mouse inoculations that took several weeks.

The new 15-minute test is done with a fluorescent labeling agent or dye developed by the Borden Chemical Company's Dajac Laboratories, Philadelphia.

Antibodies against rabies are covered with the dye. Then the mixture is poured over a slide containing the material to be diagnosed. If rabies is present, the dye will "tag" the harmful organism with a greenish fluorescence.

This technique may also be used in the future for more rapid diagnosis of other diseases such as diphtheria, polio, influenza, typhus and Rocky Mountain spotted fever. Studies are now underway to determine how useful this test will be in detecting venereal diseases.

The dye, fluorescein isothiocyanate, was used in a Florida field trial. It proved successful in 144 cases of suspected rabies in animals. Specimens from the animals were given the new test as well as the mouse inoculation test, which up to now has been the only completely accurate means of detecting the rabies virus. The results of the two methods agreed 100% with the U. S. Department of Health, Education and Welfare's Communicable Disease Center reported.

Scientists hope soon to be able to detect rabies virus in humans by this quick method. The test is based upon a fluorescent antibody technique discovered ten years ago by Dr. A. H. Coons of Harvard University.

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## AGRICULTURE

# Seed for Tomorrow

**With bad seed no amount of fertilization and cultivation will produce a high yield, yet good seed can bring the benefits of plant breeding to farmers.**

By BENITA TALL

THE PROSPERITY of a nation can rest within a tiny seed.

This is no over-statement, but a fact. A poor seed will develop into a poor plant. Many poor plants mean low yields for the farmer. And low yields for the farmer—especially in a nation whose economy is based on agriculture—can mean lowered living standards and poverty for the nation.

Throughout centuries of man's history as a farmer, the seeds he has sown for his food and his animals' food have been the big "question mark" in his life. If good seed were planted, it was largely a matter of chance; the qualities of the seed usually were unknown. Sometimes a field produced a good yield and the farmer could save the seed for the next planting. Sometimes a neighbor's field had a high yield and the seed was shared in hopes of continuing and spreading the prosperity that good seed brought with it.

It was in such simple ways that seed selection was practiced. Today, however, this has become an extremely complex and important work involving governments as well as individuals.

An example of the benefits the use of improved seed can bring to a nation's agriculture is seen in the development of hybrid corn in the United States. It is perhaps the most striking example of the application of genetic principles to practical breeding.

## Corn Yield Increases

From 1933 to 1956, the percentage of hybrid corn in the total U. S. corn crop grew from 0.2% to 96%. Our farmers now receive increased annual yields of at least 750,000,000 bushels through use of double hybrid seed. This, in turn, represents an annual dividend of \$75 for each research dollar spent on breeding.

Other countries have benefited from similar seed research projects. Largely as a result of the introduction of an improved variety of rice, the average yield of this important food crop in Egypt has increased more than 30% within the past few years.

The creation of Marquis wheat in Canada made possible the opening of the prairie provinces for cereal production. This has meant an increased financial return of \$100,000,000 each year for at least 15 years.

Throughout western Europe the use of hybrid corn is increasing. It has been estimated that the value of the increased production due to the use of hybrid corn in some 15 countries now amounts to about \$70,000,000.

Improved varieties of cotton helped Brazil

weather several economic crises in past years.

Recently the Food and Agriculture Organization, a United Nations body, has played a leading role in promoting international cooperation for the use of high-quality seed. It has brought technical assistants and equipment to under-developed countries. As an established organization for the exchange of scientific information, many countries have used its facilities. FAO is now engaged in a program of support for a world seed campaign. The use of first-class seed is the most rapid and effective, as well as the cheapest way of making available to the farmer the results and progress of the plant breeder's work, B. R. Sen, director of FAO, said recently.

In many respects what FAO seeks to accomplish on an international scale, especially in the economically underdeveloped areas, the U. S. has already achieved.

A three-point program has been suggested for each national government to follow in their seed improvement campaign:

1. crop and tree improvement;

2. seed production, certification and distribution;

3. education, extension and propaganda.

In the U. S., the Department of Agriculture participates in the whole seed program through its regulatory and research divisions.

The newest phase of this work was recently opened with completion of our National Seed Storage Laboratory on the campus of Colorado State University at Ft. Collins. Here the country's precious store of seeds can be preserved and maintained for future possible use.

The Laboratory, a \$450,000-facility directed by Dr. Edwin James, past regional coordinator for the southern regional cooperative program on new crops, houses valuable breeding stocks. In its special rooms will be kept the permanent seed collection of all introduced species still remaining from some 60 years of plant exploration, as well as breeding stocks recommended as of possible value for the future.

## Ideal Storage

Close wild relatives and primitive varieties of important crops can also be kept under the ideal conditions they need—whether it is low temperature and high humidity or high temperature and low humidity or any combination of these factors.

The Laboratory will also maintain a "master file" of worthwhile plant varieties. Any qualified scientist in the U. S. and its possessions may receive laboratory seed



**SEED VAULTS**—A tray of some of the individual seed containers in the National Seed Storage Laboratory, Ft. Collins, Colo., is checked by Dr. L. N. Bass, U. S. Department of Agriculture seed physiologist. About 300,000 seed accessions of one quart each could be kept in the laboratory's nine storage rooms. Various temperature and humidity levels can be maintained in these rooms.

(without cost) if it is not available elsewhere. It will also be possible for foreign researchers to obtain needed seed.

The value of a specific seed stock as basic germ plasm for the future is the criterion for acceptance. Each one accepted must be fully documented as to source and its development history, the USDA pointed out. Seeds will be tested from time to time to ensure that deterioration does not set in.

Actually, our national seed laboratory might be looked upon as the culmination of a program. Many other nations have yet to achieve adequate programs for testing and breeding new varieties of seed, selecting seed for use under specific conditions and climate, arranging for distribution of high quality seed, and improving seed production techniques such as seed bed preparation, weed control, harvesting, grading and storing.

Various countries will have various needs in the field of seed research and study. In most of the underdeveloped countries there is an urgent need for better education and propaganda showing the concrete benefits that can be achieved with better seed.

With growing populations, many peoples throughout the world face a very real problem of food shortage in the near future. Starvation is a problem today for some. One of the quickest and most efficient methods that could be used to reverse this trend is the extensive use of high quality seed.

Every farmer, from Chile, India, Egypt, Cambodia, to The Netherlands, Sweden, Canada and the United States, can see with his own eyes what happens when he plants "good" seed.

The good seed may mean food on what had been a bare table. Or it may mean a new money crop. Either way, the tiny seed is acquiring new importance here and throughout the world.

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#### ENGINEERING

### Soviets Claim Inventing "Underground Rocket"

THE RUSSIANS claim they have developed the first underground rocket for burrowing holes in the earth.

A report by the Central Intelligence Agency in Washington says the rocket nose has a pulverizing device which contains liquid fuel and compressed air. In operation, "powerful flames spout from openings in the pulverizer" to open a path for the rocket. The rocket, which can be guided, thus opens a cylinder-like tunnel as it blazes its way through the earth, the CIA report said.

Quoting from the magazine *Magyar Nemzet*, published in Budapest, the CIA reports the rocket was invented by engineers of Tadzhik S.S.R. of the U.S.S.R.

First experiments have yielded satisfactory results. In practice, the device is to be used for laying underground irrigation canals and pipes, the report states.

United States Government experts specu-

late that the rocket may be a further development of a technique used in the U. S. for "ten years." In this technique, known as jet flame piercing, a flame fed by oxygen is used to flake off rock—a process known as spalling. Washington mining experts believe the Russian rocket is a combination of several similar "cutting heads" which would cover an area large enough to make a tunnel.

One U. S. Bureau of Mines expert said the Russian term "underground rocket" is probably more graphic than accurate.

"The name implies the rocket gets in there and zoom! There she goes!" Actually, he said, the drilling process probably would be slow.

The Russian underground rocket probably is guided by controlling the play of flame from the rocket head, but even so it would probably cut a "wiggly path," one expert said. He implied the Russian rocket would have to be quite spectacular to outclass the fast cable-laying machinery now used in America. Some of this machinery not only digs a straight trench, but fills it after the cable is laid.

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#### MEDICINE

### Man's Cancer Disappears After Blood Injection

A 32-YEAR-OLD man apparently has been cured of cancer after receiving blood from a second man who had spontaneously recovered from the same kind of cancer.

Drs. Wilbur C. Sumner and Alvan G. Foraker of Jacksonville, Fla., told the James Ewing Society meeting in New York that they acknowledged the possibility of coincidence. But they pointed out that only one previous case is known in which a person spontaneously recovered from malignant melanoma, the type of cancer that often starts in moles.

(Malignant melanoma can be cured if removed by surgery in a very early stage. If neglected, it tends to spread swiftly and cannot be benefited by radiation or any known chemical agents.)

The young man recovered at the age of 28. A year later, a small cancer area was found in one finger, which was removed. Since then, there has been no further sign of the disease.

The young man's recovery suggests that the 250 cubic centimeters of blood he received must have contained some type of defense against melanoma, and that this was transferred to him, the doctors said.

National Cancer Institute laboratory tests on blood samples from both patients revealed no virus activity. No effects were seen when the sera was added to melanoma cells growing in test tubes or mice. This might be due to species differences, the doctors said.

A third patient with a far-advanced case was similarly treated. But there was no beneficial effect. This patient, however, unlike the others, had widespread internal deposits of cancer.

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## OPTICAL BARGAINS

### D-STIX TEACHING AIDS

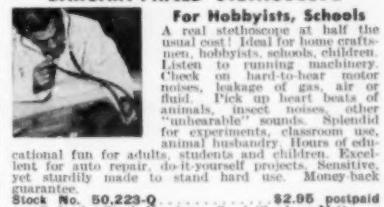
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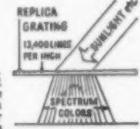
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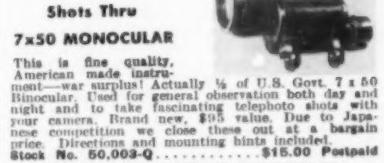


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For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D.C. Request free publications direct from publisher, not from Science Service.

**THE AMPHETAMINES: Their Actions and Uses**—Chauncey D. Leake—*Thomas, C. C.*, 167 p., \$4.50. Survey of significant aspects of various drugs chemically and pharmacologically related to amphetamine sulfate.

**THE ATLANTIC CABLE**—Bern Dibner—*Burndy Lab.*, 96 p., illus., \$3.50, paper: \$2.50. Historical account of the Anglo-American technical achievement which, by linking the telegraph lines of two continents, made electrical communication possible on a world-wide scale.

**AUTOMATION AND SOCIETY**—Howard Boone Jacobson and Joseph S. Roucek, Eds.—*Philosophical Lib.*, 553 p., \$10. In this handbook 32 experts examine the present and potential impact of automation on different aspects of our society. Automation dictionary included.

**CHALLENGERS OF THE DEEP: The Story of Submarines**—Wilbur Cross—*Sloane*, 258 p., illus., \$5. Surveys the history of underwater boats,

the men who built and sailed them, from Bushnell's *Turtle* to the atomic *Skipjack*.

**COLLEGE ZOOLOGY**—Robert W. Hegner and Karl A. Stiles—*Macmillan*, 7th ed., 726 p., illus., \$7.50. Introductory text covering the animal world from simple to complex organisms including man.

**COMPUTATIONAL METHODS OF LINEAR ALGEBRA**—V. N. Faddeeva, transl. from Russian by Curtis D. Benster—*Dover*, 252 p., paper, \$1.95. Summarizes the most important numerical methods of linear algebra.

**DICTIONARY OF MODERN CHESS**—Byrne J. Horton, with James B. Horton and Dorothy Bawden Horton—*Philosophical Lib.*, 224 p., illus., \$6. General and basic terms, diagrams of chess openings, biographical sketches and organizations.

**THE DYNAMICS OF PARTICLES AND OF RIGID, ELASTIC AND FLUID BODIES: Being Lectures on Mathematical Physics**—Arthur Gordon Webster—*Dover*, 2nd ed., 588 p., illus., paper, \$2.35. Reprint of 1912 second edition.

**ENCYCLOPEDIA OF AMERICAN ASSOCIATIONS**—*Gale Research Co.*, 2nd ed., 716 p., \$20. Directory of non-profit organizations, arranged in 20 sections, among them scientific, technical and educational organizations. Fully indexed.

**EXCURSION FLORA OF THE BRITISH ISLES**—A. R. Clapham, T. G. Tutin and E. F. Warburg—*Cambridge Univ. Press*, 579 p., \$4.50. Keys and descriptions, portable version designed for the student and amateur botanist.

**EXPERIMENTAL STUDIES ON THE NATURE OF SPECIES, IV: Genetic Structure of Ecological Races**—Jens Clausen and William M. Hiesey—*Carnegie Inst.*, 312 p., illus., \$4.75, paper: \$4.25. Investigates the ecological races of the perennial *Potentilla glandulosa*, which inhabit a wide range of climates.

**GENERAL CIRCUIT THEORY**—Gordon Newstead—*Wiley*, 144 p., \$3. Pocket-size handbook, emphasizing development of general relationships rather than detailed analysis of electric circuit theory.

**GROUP THEORY and its Application to the Quantum Mechanics of Atomic Spectra**—Eugene P. Wigner, transl. from German by J. J. Griffin—*Academic*, expanded and improved ed., 372 p., \$8.80. Includes new chapters on time inversion and Racah coefficients.

**THE HISTORICAL BACKGROUND OF THE DEAD SEA SCROLLS**—Cecil Roth—*Philosophical Lib.*, 87 p., \$4.75. Monograph dealing with the circumstances surrounding the Scrolls from a purely historical viewpoint.

**HUMAN PHYSIOLOGY**—Thomas F. Morrison, Frederick D. Cornett and J. Edward Tether—*Holt*, 408 p., illus., \$5.32. Introductory text for secondary school students.

**HURRICANE**—Marjory Stoneman Douglas—*Rinehart*, 393 p., illus., \$5.95. Scientific facts and historical data tell the story of hurricanes from the time of Columbus to Hurricane Audrey in 1957.

**ILLUSTRATED GUIDE TO U. S. MISSILES AND ROCKETS**—Stanley Ulanoff—*Doubleday*, 128 p., illus., \$3.95. For quick reference, gives facts about the 65 basic missiles and rockets in use and under test by U. S. Army, Navy, Air Force and NASA.

**INSIGHT INTO ASTRONOMY**—Leo Mittersdorf—*Lantern Press*, rev. ed., 247 p., illus., \$4. Brought up to date in connection with changes in our concept of the size and age of the universe, with chapter on artificial satellites added.

**THE INTEGRATED CLASSROOM**—H. Harry Giles—*Basic Bks.*, 338 p., \$5. A New York University professor of education analyzes the nature of the social conflict and provides concrete examples of how classroom integration is being handled around the nation.

**JOURNAL OF MOLECULAR BIOLOGY**, Vol. I, No. 1—J. C. Kendrew, Ed.-in-Chief—*Academic*, 86 p., illus., paper, six issues per annum, \$14. Publishes papers on the nature, production and replication of biological structure at the molecular level, and its relation to function.

**LANDSCAPE FROM THE AIR: A Physical Geography in Oblique Air Photographs**—F. J. Monkhouse—*Cambridge Univ. Press*, 53 p., illus., \$1.75. Descriptions with photographs showing rock formations, vulcanicity, river valleys, glaciation and coast lines.

**MANUAL OF INSECT MORPHOLOGY**—E. Melville DuPorte—*Reinhold*, 224 p., illus., \$5. Zoology text concerned with the evolution of structure in the species.

**MARINE ELECTRONICS HANDBOOK**—Leo G. Sams—*Sams*, 232 p., illus., paper, \$3.95. Information about the various kinds of electronic devices used on pleasure craft and commercial vessels.

**MEDICAL SCIENCE AND SPACE TRAVEL**—William A. Kinney, introd. by Major General Harry

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NATIVE PEOPLES OF SOUTH AMERICA—Julian H. Steward and Louis C. Faron—*McGraw*, 481 p., illus., \$8.50. Summarization of the six-volume Handbook of South American Indians, with interpretations. For the student and general reader.

THE NIMONIC ALLOYS—W. Betteridge—*Arnold, E. & Co. (St. Martins)*, 332 p., illus., \$15. Brings together information on high-temperature materials, their constitution, properties and uses.

PACKAGE DESIGN ENGINEERING—Kenneth Brown—*Wiley*, 263 p., illus., \$8.50. Course in the fundamental engineering approach to industrial package design.

PLANE TRIGONOMETRY—Nathan O. Niles—*Wiley*, 234 p., \$3.95. Textbook stressing analytical aspects of trigonometry.

REPRODUCTION IN DOMESTIC ANIMALS, Vol. I—H. H. Cole and P. T. Cupps, Eds., foreword by Herbert M. Evans—*Academic*, 651 p., illus., \$14. Treatise dealing with the complex mechanisms involved in the reproduction of higher animals, the internal (nervous and endocrine) and external (food and environment) factors which play vital roles in breeding farm animals.

SOVIET PHYSICS: Technical Physics, Vol. 3, No. 1, A Translation of the *Journal of Technical Physics* of the Academy of Science of the USSR (Russian Original Vol. 28, No. 9)—Robert T. Beyer, Chmn.—*Am. Institute of Physics*, 219 p., illus., paper, monthly, annual subscription starting with Vol. 3, No. 1: \$75, libraries of non-profit academic institutions: \$5.

THE SPECTRUM OF BETA LYRAE—J. Sahade and others—*Am. Philosophical Soc.*, 64 p., illus., paper, \$2. Contains atlas of 195 Mount Wilson coudé spectrograms. Vol. 49, Part 1 of the *Transactions*.

SULFUR IN PROTEIN: Proceedings of Symposium held at Falmouth, Mass., May 1958—Reinhold Benesch and others, Eds.—*Academic*, 469 p., illus., \$14. Deals with the role of sulfur in a variety of biological systems, presenting the findings of recent research.

SYMPOSIUM ON RADIOACTIVITY IN INDUSTRIAL WATER AND INDUSTRIAL WASTE WATER—A. Louis Medina and others, introd. by A. R. Belvey—*Am. Soc. for Testing Materials*, 70 p., illus., \$2.50. Discussion of test methods and samples.

THEY EXPLORED! Humboldt, Livingstone, Frémont, Hedin, Scott, Herzog—Rhoda Hoff and Helmut de Terra—*Wadsworth*, 120 p., illus., \$3.25. Tells young people why these men explored, what they discovered and how the world benefited from their explorations.

URANIUM AND OTHER MIRACLE METALS—Fred Reinfeld—*Sterling*, rev. ed., 128 p., illus., \$3.95. Tells the general reader what uranium is, where and how it is being mined and how it is used in atomic energy, radioactive drugs and other peacetime applications.

VIRUS GROWTH AND VARIATION: Ninth Symposium of the Society for General Microbiology—A. Isaacs and B. W. Lacey, Eds.—*Cambridge Univ. Press*, 272 p., illus., \$7. Symposium was held at University of London in April 1959.

YOUR MICROSCOPE AND HOW TO USE IT—Hy Ruchlis and Bernard Friedman—*Science Materials Center*, 32 p., illus., paper, 70¢. Pamphlet explains parts of the microscope, tells boys and girls how to use it, suggesting experiments.

Science News Letter, June 6, 1959

#### AGRICULTURE

## Russia Is Third Largest Producer of Fats and Oils

THE SOVIET Union is now the third largest producer of fats and oils in the world, exceeded only by the United States and Communist China. Its estimated 1958 production was 2.6 million metric tons.

Edible vegetable oils accounted for the main share of the output, followed by lard and tallow, butter, and fish and whale oils.

These figures, based largely on Russian sources, have been published by the Food and Agriculture Organization.

Total 1958 production of edible vegetable oils, including those extracted from imported seeds, is estimated at about 1.2 million tons. In 1959 it is likely to reach an all-time record, mainly because of an exceptionally good sunflower seed harvest.

Increased Russian production of oilseeds has been accompanied by improved extraction processes, the FAO reports. Hydraulic presses have been almost completely replaced by continuous screw presses and solvent extraction mills, thus increasing the yield of oil.

This technical advance doubled the extracting capacity between 1941 and 1956, although the number of plants increased only slightly.

The FAO study showed estimates of present Russian consumption, placed at about 30 pounds per head, were still far below the 61 pounds per head in North America and the 50 pounds per head in Western Europe.

Science News Letter, June 6, 1959

#### METEOROLOGY

## High-Speed Weather Network Inaugurated

THE FIRST EXTENSIVE high-speed weather facsimile network is now operating for the Air Force, doubling the previous speed at which high-altitude weather information is transmitted.

The new network links 57 Air Weather Service weather stations at Air Force bases throughout the U.S., making immediate transmission of up-to-the-minute weather maps possible. Center of the network is the Global Weather Central at Offutt AFB, Omaha.

The National Weather Analysis Center, Suitland, Md., provides the daily reports on winds, temperatures and vorticity as well as forecasts of Northern Hemisphere weather. NWAC is a joint Weather Bureau, Navy and Air Force facility.

Designed and installed by the Western Union Telegraph Company, the new network will transmit data at a speed of 120 revolutions per minute, twice present speeds. The system, known as the Strategic Facsimile Network, was developed to fulfill Strategic Air Command requirements.

Weather maps transmitted by the network are about three times larger than any now being sent by facsimile.

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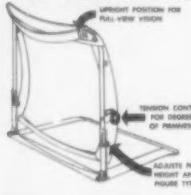
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### BIOLOGY

## Bronx Zoo Opens New Monkey House

OTTO THE POTTO performed the important ceremony of cutting the ribbon at opening day ceremonies at the Bronx Zoo, New York.

Otto, a West African relative of the monkeys, nibbled at a marshmallow joining two pieces of white ribbon and thus opened "the newest showplace of the greatest zoo in the world."

The new monkey house has had its interior completely modernized at a cost of \$350,000, and a new floor and roof have been installed. Modern play and exercise devices such as aluminum bars in various shapes, aluminum wheels and a three-spoke bar are included in the monkey compartments.

Forty-five monkeys representing 26 species are housed in the new building. They include rarities like the Woolly Spider Monkey from Brazil and two albino Toque Macaques from Ceylon.

In order to keep the monkeys away from the glass fronts of the larger compartments, the glass has been electrified to give a mild shock when touched from the monkey's side.

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ASTRONAUTICS—What two species of monkeys were sent into space? p. 355.

ENGINEERING—What is one way transatlantic television may be achieved? p. 358.

PLANT PHYSIOLOGY—How have surveys of plant life on the Marshall Islands differed? p. 359.

PUBLIC HEALTH—How is the new 15-minute rabies test accomplished? p. 361.

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- Area of a Sector of a Circle
- Distance Travelled by a Uniformly Accelerating Object
- Final Velocity of a Uniformly Accelerating Object
- Circular Motion
- Kinetic Energy
- Volume of a Cylinder
- Volume of an Oblate Spheroid
- Volume of a Cone
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Hundreds of pre-tested and age-graded science kits, instruments, records, toys, etc.—to fascinate and inform young people from 4-16—are described in the illustrated Catalog of the Science Materials Center, a division of The Library of Science. Here is the first central source of expertly selected yet reasonably priced science materials for the teacher, scientist and science-minded parent. Check and return coupon to receive your Free Catalog.

# • New Machines and Gadgets •

For sources of more information on new things described, send a self-addressed stamped envelope to SCIENCE NEWS LETTER, 1719 N St., N.W., Washington 6, D.C., and ask for Gadget Bulletin 990. To receive this Gadget Bulletin without special request each week, remit \$1.50 for one year's subscription.

**TWO-BATTERY FLASHLIGHT** has a bright red, unbreakable plastic signal hood extending out over the lens and a powerful magnet in its large switch. The signal hood, available in three- and five-inch lengths, projects a warning glow for a half mile without obstructing the light beam. The magnet switch has a pull of 15 pounds and holds the flashlight fast to any steel surface.

Science News Letter, June 6, 1959

**LOW-FRICTION BOTTOM COATING** for racing and pleasure boats reduces friction or drag against water by three to five percent. Both the coating and a special primer beneath it may be applied by brush as received, without extensive sanding and polishing of the surface.

Science News Letter, June 6, 1959

**WRITE-ON LABELS** for outdoor use stick without moistening to any dry surface and withstand extremes of heat or cold. They come in three sizes and their surfaces are permanently protected against dirt and moisture.

Science News Letter, June 6, 1959

**PEG AND STICK GAME**, shown in the photograph, consists of a peg weighing less than a half ounce and a narrow lightweight stick, both made of durable polyethylene. The game is played by putting the peg on



the ground, striking it with the stick on one of its ends to catapult it into the air, and then striking it with the stick as you would hit a baseball. Instructions are included and variations may be devised.

Science News Letter, June 6, 1959

**ICE CREAM FREEZER** for back-yard ice cream making has a tub of polyethylene in a choice of aqua blue or white. The tub's bottom and turned-over carrying rim are of double thickness. The freezer can

make up to four quarts of ice cream at a time.

Science News Letter, June 6, 1959

**BIMETALLIC THERMOMETERS**, calibrated for an accuracy of plus or minus one percent over a range of minus 100 degrees Fahrenheit to plus 1,000 degrees, are made of stainless steel, including the welds. Heavy glass windows offer high resistance to breakage. The thermometers are available with either three-inch or five-inch diameter heads.

Science News Letter, June 6, 1959

**DOUBLE-ACTION SEESAW** teeters up and down like a conventional seesaw and spins around circularly on its axis. Designed primarily for children under ten years of age, it has self-leveling seats to prevent falling off. Made with tubular steel supports, double cross bar and safety handles, the seesaw has three balancing points to accommodate different sizes.

Science News Letter, June 6, 1959

**COOKING GUIDE** for aluminum-wrapped meats is in the form of a card-board, grease-proof slide rule. Initial setting of the meat's weight, for any of the 15 cuts of beef, veal, lamb, pork and poultry, indicates times and temperatures for rare, medium or well-done stages.

Science News Letter, June 6, 1959

## Nature Ramblings

By BENITA TALL

CONSERVATION can begin at home right in your own back yard.

Most persons think of conservation with a big, impersonal capital "C"—not as including practices that an individual can put to use.

We are all familiar with the stories of the nation's dust bowls. Careless, wasteful farming and grazing methods have cost us tons of irretrievable top soil. Unscientific forestry methods have also caused huge losses in timber resources and destroyed watersheds.

Yet, today we tend to think of dust bowls and denuded forests as things of the past. In our imaginations we see contour-plowed and terraced fields covering acres of lands. Windbreaks extending for miles, tons of fertilizers, compost and mulches, extensive irrigation projects—all these seem an integral part of conservation.

### Back Yard Conservation



Conservation seems synonymous with large size.

This is definitely not true, however. Just about every conservation practice that can be used on 1,000 acres can be used on half an acre. As a result of using conservation you can produce more and better fruits, vegetables and flowers in a back yard that is both attractive and a pleasant place in which to work.

A pine tree windbreak makes a garden cosier for working in the early spring or late fall in addition to reducing water evaporation. Ground cover vines, Pachysandra and wintercreeper are but two of many, protect soil on steep banks from erosion in addition to growing on "difficult" ground such as under trees.

A strip of wood or suitable metal can end soil gullies caused by water pouring out an eaves gutter downspout. Garden waste, such as dead flowers, overripe vegetables, lawn clippings, makes a good compost with the addition of a few chemicals to promote decomposition. Mulches of hay, leaves, pine needles, or lawn clippings improve soil, check weeds and erosion and are generally "good conservation."

Conservation in the back yard can add to the fun of gardening as well as contribute to the community and the nation.

Science News Letter, June 6, 1959

